

# HERPETOFAUNA OF AN URBAN AREA NEAR PERTH, WESTERN AUSTRALIA

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## ABSTRACT

The study area is located in the south of the City of Canning between the Perth city centre and the outer suburb of Armadale. Notes are included on the local distribution, relative abundance and habitat preferences for the 33 reptiles and 9 frogs recorded. The frog *Crinia georgiana* and legless lizard *Aprasia pulchella* are infrequently recorded from the coastal plain in this region. The gecko *Crenadactylus ocellatus* may have been inadvertently transported into the area.

## INTRODUCTION

Most published data on the herpetofauna of the Perth region are from studies done north of the Swan River (Storr *et al.* 1978; How and Dell, 1990) or the Darling Range (Wellington and Dell, 1989). Little has been published from areas to the south. Turpin (1990 and 1991) demonstrated the importance of suburban remnant bushland in conserving a rich diversity of herpetofauna in an area surrounded by considerable degradation through urban and industrial development. My study reports on the reptile and amphibian fauna in some of the southern suburbs and outlines the effects of urbanisation.

## DESCRIPTION OF STUDY AREA

The study area is located approximately 13 kilometres south of Perth and is bounded in the north by the Canning River, in the east by Nicholson Road, in the west by Rossmoyne and in the south by Canning Vale (see Figure 1). For the purpose of this study the area was divided into 2 zones. The Southern Zone comprised the suburb of Canning Vale and the Suburban Zone comprised the 6 suburbs of Ferndale, Lynwood, Riverton, Rossmoyne, Shelley and Willetton.

According to Seddon (1972) the study area lies within 2 landform units, these are the Pinjarra Plain which consists generally of unconsolidated fluvial sediments and the Bassendean Dune System that represents a Pleistocene accumulation of beach sands along an old coastline. This dune system occupies most of the study area and is the main stronghold for *Banksia* spp. Seddon also recognised 16 soil associations on the Swan Coastal Plain. Three of these are within the study area:

- A. The Canning River lies within the Swan soil association and consists of red podsolic and undifferentiated alluvial soils along the present river course.
- B. The western boundary of the Southern Zone enters the Bassendean soil association which consists of grey and yellow sand dunes with sandy swamps in the low-lying areas.

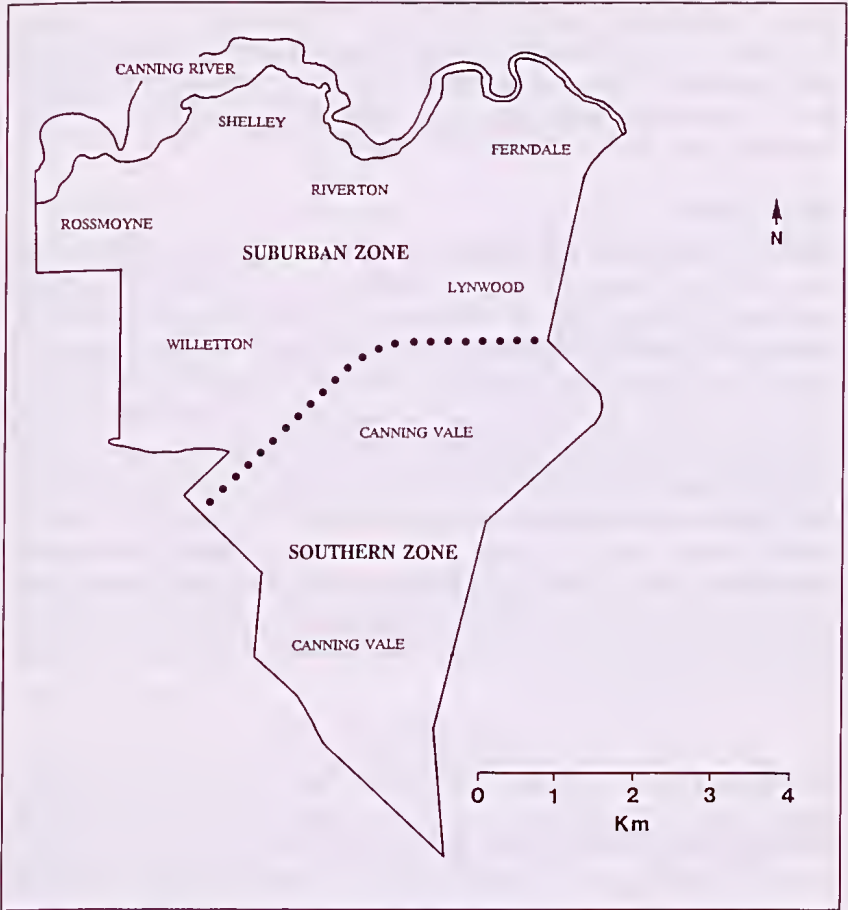


Figure 1. Map showing areas mentioned in text.

C. The area east of the Bassendean soil association and Suburban Zone consists generally of grey sand dunes with intervening clayey swamps. These soils are termed the Southern River association.

### Suburban Zone

All observations in this zone were recorded from the remnant pockets of bushland and creek/swamp systems that occur in the 6 suburbs mentioned previously. These habitats have been considerably degraded and retain only scattered patches of trees: *Eucalyptus marginata*, *E. calophylla* and *Banksia* spp. The disturbance has allowed the introduced veldt grass *Ehrharta calycina* to become well established. In this zone there are some swampy creeks that flow through the suburbs although the vegetation along these has been greatly reduced also. The dominant surviving vegetation is a fringe of *Melaleuca raphiophylla*. The vegetation associated with the Canning River is characteristic of a freshwater environment in the Perth

region. Dominating along the river edge is *M. raphiophylla*, *Typha orientalis* and *Casuarina obesa*. Away from the river on the flood plain is *Eucalyptus rudis* woodland, *Polypogon monspeliensis* and *Juncus kraussii*. The sapphire species *Sarcocornia quinqueflora* and *Halosarcia halocnemoides* are the dominants along the river in the salt-marsh areas.

### Southern Zone

The main communities characteristic of the Bassendean soil association are open woodlands consisting of *E. marginata* and *E. calophylla* over a small tree storey of *Banksia* spp. A tall shrubland is most prevalent where *B. attenuata*, *B. grandis*, *B. ilicifolia* and *B. menziesii* occur in varying degrees of density over a mixed low understorey. *Allocasuarina fraseriana* is common here also. In the low-lying areas that are subject to seasonal flooding *Melaleuca preissiana*, *Nuytsia floribunda* and *Xanthorrhoea* sp. are dominant. Dominant species in the tall shrub layer are *Jacksonia furcellata*, *Adenanthos sericea*, *Kunzea ericifolia* and *Macrozamia reidleyi*. The low shrub layer is variable with some common representatives being *Hypocalymma angustifolium*, *Acacia pulchella* and *Verticordia* spp. Crook and Evans (1981) provide a detailed account of the representation of the Bassendean soil and vegetation complex on the Thomsons Lake Nature Reserve to the south-west of the present study area.

### METHODS

The methods used to locate and observe the reptiles and amphibians included raking through leaf litter and other surface debris; turning over by hand rocks, logs, sheet iron etc; pit-trapping both with and without drift fences; spotlighting from vehicle on warm nights; and opportunistically encountering active animals. No headtorching for nocturnal species was carried out.

Opportunistic observations were made between 1977 and 1987 to determine the herpetofauna occurring within this urban area. Figure 2 shows the relative abundance (frequency of observation) between species of reptiles located during this 10 year study.

## LIST OF SPECIES

### LEPTODACTYLIDAE (Ground Frogs)

*Crinia georgiana* (Quacking Frog)

Only found in low-lying wetlands in southern zone.

*Heleioporus eyrei* (Moaning Frog)

Very common throughout the area in close proximity to swamps and low-lying places. Often excavated from burrows beneath logs and rubbish during winter.

*Limnodynastes dorsalis* (Banjo Frog)

Very common in southern zone. Only recorded from near swamp/creek systems in suburban zone. Abundant beneath rubbish during winter.

*Myobatrachus gouldii* (Turtle Frog)

Three records: 1977 in dark coarse soil at Lynwood; and 2 adults on different days in August 1986 at Canning Vale - one was excavated from a bulldozer soil heap in Banksia woodland and the other was excavated from soil beneath fallen bark.

*Pseudophryne guentheri* (Guenther's Toadlet)

Very common in low-lying wetlands in southern zone and generally found beneath logs and rubbish in suburban zone.

*Ranidella glauerti*

Heard calling from a number of ephemeral swamps and gullies in southern zone and also from a permanently watered creek in Lynwood.

*Ranidella insignifera*

Found throughout the area in low-lying wetlands, swamp/creek systems and along the Canning River.

### HYLIDAE (Tree Frogs)

*Litoria adelaidensis* (Slender Tree Frog)

Very common in *Typha* vegetation along the Canning River. Only found in low-lying wetlands in southern zone.

*Litoria moorei* (Western Green Tree Frog)

Very common throughout the entire area wherever any body of water occurs including backyard swimming pools.

### CHELUIDAE (Freshwater Turtles)

*Chelodina oblonga* (Oblong Turtle)

Found in the Canning River and major swamps in the area. During this 10 year observation period a large population existed in a Water Authority treatment plant on an oval in Lynwood.

### GEKKONIDAE (Gecko Lizards)

*Crenadactylus ocellatus* (Clawless Gecko)

A single animal found beneath a wooden boat in a suburban backyard at Lynwood in 1981.

*Phyllodactylus marmoratus* (Marbled Gecko)

Most specimens were found active at night on roads while spotlighting in *Banksia* woodland at southern zone, the very few sightings from the suburban zone include an animal taken from inside a letterbox on 2 October 1981 at Lynwood.

PYGOPODIDAE (Legless Lizards)

*Aprasia pulchella*

One beneath a sheet of iron on soil at Riverton on 4 October 1980 and another nearby on the following day.

*Aprasia repens*

Mainly found in soil beneath logs and rubbish, inside soil heaps (particularly on the edge of tracks) in the southern zone.

*Delma fraseri* (Fraser's Legless Lizard)

In *Banksia* woodlands in the southern zone and in the Willetton area beneath rubbish, inside spoil heaps and inside dead *Xanthorrhoea*.

*Delma grayii*

Only recorded in southern zone where it mainly shelters inside dead *Xanthorrhoea* and beneath rubbish. Appears to prefer low-lying areas where *Xanthorrhoea* is dominant.

*Lialis burtonis* (Burton's Legless Lizard)

Found throughout the area. Observed active both day and night and collected beneath rubbish, logs and piles of decaying vegetation.

*Pletholax gracilis*

Adult pit-trapped among low shrubbery in *Banksia* woodland on deep white sand on 22 December 1984 at Willetton.

*Pygopus lepidopodus* (Common Scalyfoot)

Found in *Banksia* woodland in the southern zone and Willetton. Mostly located active on roads at night.

AGAMIDAE (Dragon Lizards)

*Pogona minor* (Bearded Dragon)

Found throughout the area. Mainly observed basking on living and dead *Banksia* trees and *Xanthorrhoea*, occasionally found beneath rubbish.

*Tympanocryptis adelaidensis*

Four adults pit-trapped among low shrubbery in *Banksia* woodland at Willetton between 16-22 December 1984.

SCINCIDAE (Skink Lizards)

*Bassiana trilineatum* (Swamp Skink)

Very common throughout the area, particularly beneath rubbish near swamps and the Canning River as well as active in peripheral vegetation.

*Cryptoblepharus plagiocephalus* (Wall Skink)

Very common throughout the area on a wide variety of trees and shrubs. Also frequently seen on wooden, brick and cement-sheet fences and houses.

*Ctenotus fallens*

Appeared to prefer the low-lying more damper areas such as the fringing flooded gum woodland near the Canning River at Ferndale. Most often found beneath rubbish.

*Ctenotus impar*

Found in the southern zone beneath rubbish, inside spoil heaps and observed active in *Banksia* woodland.

*Ctenotus lesueurii*

Only recorded in southern zone where it was observed active in *Banksia* woodland and also found beneath rubbish.

*Egernia napoleonis* (Napoleon's Skink)

Only recorded in southern zone where it shelters in dead *Xanthorrhoea* and sometimes beneath bark on dead *Banksia* trees.

*Hemiergis quadrilineata* (Yellow-bellied Skink)

Frequently found beneath leaf litter and other surface debris in backyards in Rossmoyne and Wilson near Canning River, elsewhere found beneath logs in southern zone where less numerous.

*Lerista elegans*

Mostly found in soil beneath logs and sheet iron in the southern zone.

*Lerista lineata*

Two records from the southern zone: four animals in loose soil beneath sheet iron and clay tiles on 18 August 1984; and one from soil beneath abandoned stick-ant nest in *Banksia* woodland on 10 October 1987.

*Menetia greyii* (Grey's Skink)

Very common throughout the area especially where rubbish provides shelter. Most abundant reptile in study area (see Figure 2).

*Morethia obscura*

Four adults observed active among low shrubbery in *Banksia* woodland at Willetton on 30 August 1984.

*Tiliqua occipitalis* (Western Bluetongue)

An adult found beneath car door in *Eucalyptus/Banksia* woodland in southern zone on 10 October 1987.

*Tiliqua rugosa* (Bobtail)

Found throughout the area. Mostly encountered beneath sheet iron and other rubbish or seen active in southern zone.

VARANIDAE (Monitor Lizards)

*Varanus gouldii* (Gould's Monitor)

Mainly found beneath sheet iron (particularly car bonnets), inside dead logs after being observed nearby and seen active in southern zone.

TYPHLOPIDAE (Blind Snakes)

*Ramphotyphlops australis*

One record from suburban zone and two from southern zone: an animal inside a bulldozer spoil heap at Lynwood in 1979; one on 15 August 1981 beneath iron in grassland and one beneath fragmented cement slab on 10 March 1986.

*Ramphotyphlops waitii*

An aggregation of 10 sub-adults beneath a rock in a suburban yard at Shelley in 1979.

ELAPIDAE (Front-fanged Land Snakes)

*Notechis coronatus* (Crowned Snake)

Three records from southern zone: a juvenile inside dead *Xanthorrhoea* on 16 July 1983; an adult active in low grass on 12 October 1985; and two beneath sheet iron in high grass on edge of bitumen road on 11 September 1986.

*Notechis scutatus* (Tiger Snake)

Found in peripheral vegetation along the Canning River and near major swamps, also beneath sheet iron and other rubbish near these.

*Pseudonaja affinis* (Dugite)

Frequently encountered in southern zone around farmlets. Always abundant during the warmer months where sheet iron and other rubbish is strewn around providing shelter both for this snake and its preferred food the house mouse.

*Rhinoplocephalus gouldii* (Gould's Snake)

Only recorded in southern zone where it sheltered inside dead *Xanthorrhoea* and beneath rubbish.

*Vermicella bimaculata* (Black-naped Snake)

Adult excavated from spoil heap in burnt *Banksia* woodland in southern zone on 3 February 1986.

## DISCUSSION

Due to the size of the area concerned, the 33 reptiles and 9 frogs recorded here exceeds the 29 reptiles and 3 frogs recorded near Perth in Bold Park Reserve by How and Dell (1990). However, with increased pressure from ongoing development, a similar survey to this carried out in several years time may find the species number has reduced.

Literature searches in the Western Australian Museum reveal that a further 10 species have been recorded near the study area on the coastal plain. They are *Diplodactylus polyopthalmus* (Kelmescott), *Diplodactylus spinigerus* (Forrestfield), *Egernia kingii* (Armada), *Varanus tristis* (Gosnells), *Morelia spilota* (Gosnells), *Acanthophis antarcticus* (Kelmescott), *Demansia psammophis* (Cannington), *Vermicella bertholdi* (Armada), *Vermicella calonotos* (Bateman) and *Vermicella semifasciata* (Gosnells). To the north of this area (Victoria Park) Turpin (1990) recorded the first *Diplodactylus alboguttatus* south of the Swan River. A lack of headtorching in my study may account for the low number of geckos and other nocturnal species.

The only possible addition is *Heleioporus psammophilus* which is similar to *H. eyrei* but differs in call and colouration. *Icrynina georgiana* is infrequently recorded from the coastal plain being much more common on the more timbered Darling Range (Tyler *et al.*, 1984). Storr and Harold (1978) recorded this species from the valleys and floodplains in the eastern zone of the northern Swan Coastal Plain.

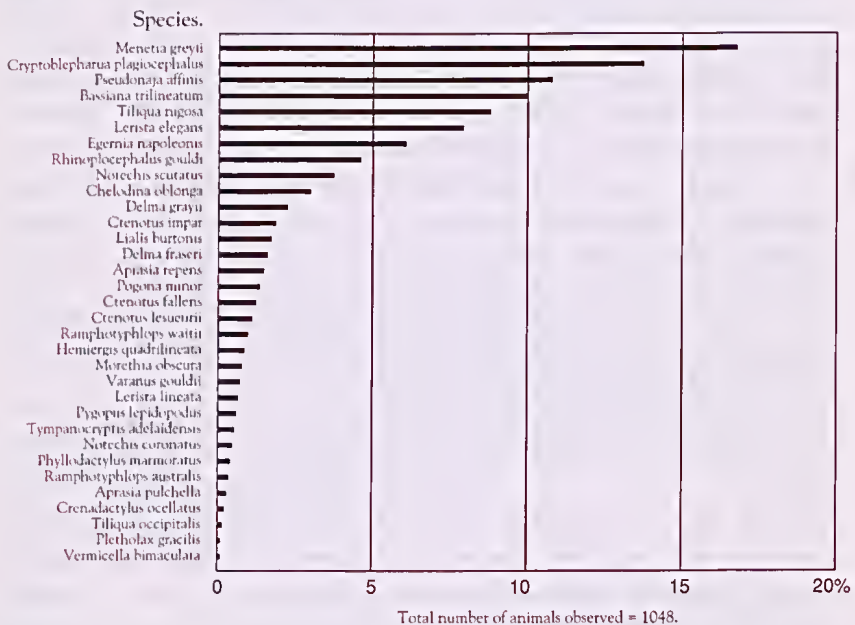


Figure 2. Relative abundance of reptiles over a 10 year period in the study area.



The gecko *Crenadactylus ocellatus* is locally common in the Darling Range, however on the coastal plain it is restricted to the Tuart belt. It is highly probable that the one found in the study area was inadvertently transported here as no other specimens were recorded and it was located in a suburban backyard. For other examples of the inadvertent movement of reptiles see Bush (1987). The few observations of geckos as demonstrated in Figure 2. is probably due to the lack of headtorching carried out for nocturnal species. The apparent scarcity of *Phyllodactylus marmoratus* in the study area is interesting considering its successful adaptation to suburban environments elsewhere. The abundance of this gecko may be in direct relation to the age of a suburb and the amount of trees that have been felled to allow for development. In the Perth Metropolitan Area they do appear to be more prevalent in the older-style suburbs. Legless lizards are well represented in the study area by 7 species. The most notable of these is *Aprasia pulchella* which is common on the Darling Range. On the coastal plain it appears to favour the clay substate found in the vicinity of the Swan River close to the foothills.

The skink lizards are the most diverse and abundant reptiles in the study area accounting for the majority of observations (number - 720, Figure 2). The species *Cryptoblepharus plagioccephalus* and *Menetia greyii* both have almost Australia wide distributions and were the two most abundant skinks recorded. However, one species *Lerista lineata* has a very small known distribution from Mandurah north to the southern suburbs of Perth. Most of the natural habitat within its range has been lost or degraded due to urban and industrial development and, as progress continues, its numbers must correspondingly decrease. It does however appear to be common Garden and Rottnest Island and in nature reserves on the mainland including Forrestdale Lake and Modong.

All the reptiles listed are within their known range and most are widely distributed throughout the south-west. The small snake *Notechis coronatus* is close to the northern end of its range in the metropolitan area, only extending north of Perth to Muchea. I have also recorded this snake just south of the study area at Forrestdale Lake Nature Reserve. The record of *Ramphotyphlops waitii* is a significant Coastal Plain record as this species is mainly found further inland on heavy soils.

The study area encompasses two extremes of major habitat for the herpetofauna in the Perth region. The Suburban Zone with almost a complete loss of the natural habitat through urban development and the Southern Zone which mostly consists of undisturbed *Banksia* woodlands with some industrial development to the north and scattered farmlets and cleared paddocks through it. The 3 species *Delma grayii*, *Egernia napoleonis* and *Rhinoplocephalus gouldii* were only found in the Southern Zone where *Xanthorrhoea* is present. Excluding this habitat association all but 2 species were recorded in both zones. To sustain species diversity in areas

undergoing massive development this illustrates the importance of even the smallest pocket of natural habitat.

Modifications to the environment through development can benefit some species. Clearing for farmlets creates or enlarges a grasslands habitat. The most common snake recorded in the study area was the Dugite, *Pseudonaja affinis* with 112 separate observations. This snake's cycle of abundance appears strongly influenced by the presence or not of semi-cleared bushland where there is plenty of introduced mammals for food and adequate shelter. Of course, once the development moves to the stage whereby the grasslands are themselves lost this species will become locally extinct.

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#### REFERENCES

- BUSH, B. 1987. The movement of reptiles in mulga fenceposts with records from Esperance, Western Australia. *West. Aust. Nat.* 16: 171.
- CROOK, I. G. and EVANS, T. 1981. Thomsons Lake Nature Reserve. In Western Australian Nature Reserve Management Plan No. 2. Fisheries and Wildlife, Perth.
- HOW, R.A. and DELL, J. 1990. Vertebrate fauna of Bold Park, Perth. *West. Aust. Nat.* 18: 122.
- SEDDON, G. 1972. *Sense of Place - A Response to an Environment the Swan Coastal Plain*, Western Australia. Griffin, Perth.
- STORR, G. M., HAROLD, G. and BARRON, G. 1978. The Amphibians and Reptiles of the Northern Swan Coastal Plain. In: How, R. A. (Ed.) *Faunal Studies of the Northern Swan Coastal Plain. A Consideration of Past and Future Changes*. W.A. Museum (unpubl. report).
- TURPIN, M. C. 1990. Ecological appraisal of an isolated Banksia woodland reserve No. 3694 south of the Swan River, Perth. *West. Aust. Nat.* 18: 131.
- TURPIN, M. C. 1991. Additions to the fauna of Reserve 3694, Victoria Park. *West. Aust. Nat.* 18: 168.
- TYLER, M. J., SMITH, L. A. and JOHNSTONE, R. E. 1984. *Frogs of Western Australia*. W.A. Museum. Advance Press, Perth.
- WELLINGTON, B. D. and DELL, J. 1989. Reptiles and amphibians of the Darling Scarp. *West. Aust. Nat.* 17: 226.